

Sleep Patterns in Children with Atopic Eczema

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Following routine appointments in a paediatric dermatology clinic, the parents of 44 young children with atopic eczema and 18 with other skin conditions were interviewed regarding sleep patterns. Sleep disorders were more prevalent in the eczema children than in the control group and normal populations. "Night waking" problems were particularly common in the eczema children, whereas settling problems were not. An association was found between scratching habits and "night waking" – the more the children scratched, the greater the likelihood of their waking at night. Consideration is given to the management of the sleep problems of eczematous children. Key words: pruritus; sleep disorder.

(Accepted March 27, 1997.)

Acta Derm Venereol (Stockh) 1997; 77: 446–448.

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Sleep disorders in early childhood are common (1). Children with certain disabilities appear to be particularly prone to such disorders. In the field of mental handicap this has been amply demonstrated by Quine (2). Stores (3) has drawn attention to the complex links with the epilepsies. There are pointers that night problems add another burdensome dimension to the care and management of children with hearing impairment (4), blindness (5) and psychiatric disorder (6). It has become apparent that atopic eczema (AE) is often accompanied by sleeping difficulties. A survey carried out by the National Eczema Society (7) revealed that 60% of the children involved had sleep disruptions. Boomer & Deakin (8) reported that 8% of the attenders at Stockport Children's Sleep Clinic had asthma or eczema. In a similar clinic in Southampton the picture was much the same and led to collaboration between the clinic and the Dermatology Department. In order to obtain a more complete picture of family needs in this area, it was agreed that a sample of parents of children with AE should be interviewed from the perspective of sleep and night-time problems and compared with a sample of children with other skin problems attending the same clinic.

MATERIAL AND METHODS

Subjects

Sixty-two children with AE and other skin problems and their accompanying parents were seen after routine appointments with a dermatologist in a paediatric outpatient department. Forty-four of the children suffered from AE. The criteria for diagnosis were those put forward by the U.K. working party (9). At the time of assessment, 41% of the children manifested mild, 27% moderate and 32% severe grades of AE. The remaining 18 children had other skin conditions, including naevi, moles, hair loss, warts and psoriasis. There were 8 boys and 10 girls (mean age 4.7 years, S.D. 4.3). The ages of the children in the study ranged from 5 months to 13 years. The dermatologist explained to the parents the shared concern to know more about the problems facing families at night. He sought their

agreement to meet a psychologist from the Sleep Clinic. There were no refusals, and the families were seen immediately after this appointment, the only exclusions being children over 13 years, and the questionnaires were administered straightaway.

Questionnaire

There were 19 sections to the questionnaire. The following areas were covered: age; gender; nature and severity of the skin condition; pre-bedtime problems (including skin care); bedtime behaviour (including any difficulties encountered); the time a child usually goes quiet or falls asleep; the time parents would ideally like the child to fall asleep; night waking times, patterns and associated problems; the demands made on the parents during the night; actual sleeping arrangements (who sleeps where); early morning patterns of behaviour; scratching habits during the day; need for help with sleep problems. It was emphasised at the beginning of the interview that parents should respond with reference to patterns in the 2 weeks leading up to the interview.

Measures

The literature reveals a wide diversity of systems for quantifying sleep disturbances in childhood. We chose as our measures "settling problems" and "night waking problems" – measures developed by Richman et al. (10) and adapted by Quine (2) in her study of mentally handicapped children.

A "settling problem" was defined as a bed-time difficulty characterised by struggles or resistance on the part of the child to sleeping or being left on his own in the bedroom. Minor difficulties of this kind are normal, and to meet the definition these had to occur at least three times a week and last for 20 min or more.

A "night waking problem" referred to a pattern where a child woke between 11 pm and 5 am. The night waking had to occur at least three nights a week and involve a parent getting out of bed or sleeping in the same bed as the child.

Pruritus, a subjective experience, cannot be measured. Scratching, which is a response to pruritus, is a measurable behaviour. Its objective quantification, however, is a complex procedure requiring sleep laboratory facilities (11) and was beyond the reach of the study. Instead, a parental estimate of scratching was used. Parents were asked to consider these patterns over the previous 2 weeks and make a rating on a scale from 1 to 5. This ranged from 1: "hardly at all" to 5: "almost all the time". "Any sleep problem" referred to the presence of either settling or night waking problems.

"Resettling time" was the parental estimate of the average time (in minutes) it took to deal with an awakened child during the night.

"Children in parental bed" referred to children spending any time in the parental bed during the night.

"All night link-up" embraced those children that spent the whole night in the same bed as a parent.

"Post 5 am behaviour problem" referred to unsettled behaviour on the part of early wakers which called for parental intervention.

Statistical analysis

The chi-square test was used to compare the number of children with settling problems, night waking problems and children who spent time in the parental bed in each of the two groups.

In Table II the Fisher's exact test was used due to the low frequency in cell 4.

The Mann-Whitney test was used to compare the mean resettling times and the mean scratch ratings of the children in both groups (see Table I).

Table I. Settling, night waking problems and scratching

	Children with AE n=44	Non-AE children n=18	Significance
Any sleep problem	35 (80%)	7 (39%)	1 p < .001
Settling problems	14 (32%)	5 (28%)	n.s.
Night waking problems	32 (73%)	4 (22%)	1 p < .001
Resettling time (minutes)	15	4.6	1 p < .001
Children in parental bed	13 (30%)	2 (11%)	n.s.
All night link-up	4 (9%)	0 (0%)	
Post 5 am behaviour problems	7 (16%)	3 (17%)	n.s.
Scratch rating (mean)	3.2	1.1	1 p < .001

RESULTS

Scratching and night waking

The results appear in Table I. On the scratching scale described above the mean rate of the AE children was 3.2 (S.D. 1.3) – significantly higher than the rate of the non-AE children – 1.1 (S.D. .2) using the Mann-Whitney test.

Children that scratched excessively (scratch ratings 4 and 5) were more likely to wake at night than those that scratched infrequently (scratch ratings 1 and 2), as can be seen from Table II).

The manner in which scratching influences night waking but not settling is clearly demonstrated in Fig. 1.

Grouping the children by their scratch ratings and considering percentages in each group with settling and night waking difficulties, it is apparent that as scratching worsened, night waking became an increasing problem. All the children with severe scratching habits (rated 5) were regular night wakers. Settling patterns, on the other hand, did not vary with scratch rates.

DISCUSSION

Our findings confirm that children with eczema are particularly prone to sleep disturbances. Our results fall between the findings of Reid & Lewis-Jones (12), who studied younger children (mean age 25 months), and Dahl et al. (13), whose subjects were older (between 6 and 12 years old).

Thirty-two per cent of the children with AE had settling problems, a prevalence similar to that of the non-AE children, but distinctly higher than in normal populations where rates around 10% would be expected. We anticipated that settling difficulties would feature more than they did. We had hypothesised that the pre-bedtime procedures of bathing, drying, cleaning and bandaging would be traumatic to both children and parents and would culminate in stressful and turbulent settling procedures. But it may be the case that once prepara-

Table II. Comparison between scratch rates and night waking problems

	Night waking problems	No night waking problems
Low scratch rates (1 & 2)	11	20
High scratch rates (4 & 5)	18	1

Fisher's exact test, $p < 0.001$.

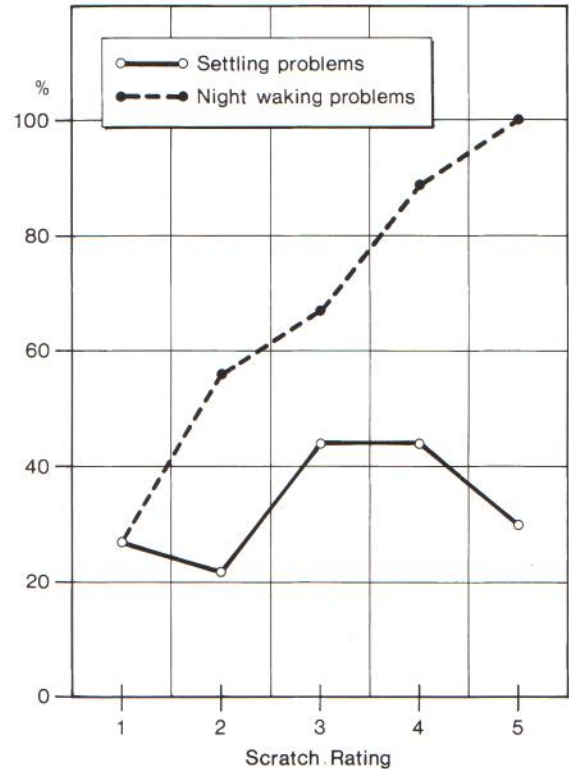


Fig. 1. Intensity of scratching and sleep problems.

tions are completed, children feel comfortable and relaxed. In normal families, parental attention at this time of the day usually helps settling procedures, and the children that concern us here of necessity had considerable parental attention in the hour leading up to bedtime. Furthermore, it is known in child care circles that clear-cut, regular, pre-bedtime routines mentally prepare (cue) young children for sleep and for the separation process this involves.

Seventy-three per cent of the children with AE in the study had night waking problems, compared with only 22% of the non-AE children – a significant difference. As other studies have shown, these nocturnal events are a major source of stress to children and to their parents. The link with scratching and, ultimately, with pruritus is strong. Monti et al. (14) examined the link between pruritus and sleep disruptions. They studied 9 children with atopic dermatitis under laboratory conditions and found that scratching episodes occurred most frequently during Stage 1 sleep, followed by Stage 2, REM Sleep, Stage 4 sleep and Stage 3 sleep. Compared with normal children, the number

of wakings and the total wake times were markedly increased. They noted a conspicuous decrease in Stage 4 slow-wave sleep. Slow-wave sleep (SWS) is also known to be decreased in children with obstructive sleep apnoea (15) and psychosocial dwarfism (16). Growth retardation is a feature of both these conditions – as is the case in AE (17). Growth hormone secretion in children mainly occurs in deep SWS. It has been suggested that lack of SWS and a consequent reduction in growth hormone may partly account for the retarded growth associated with these conditions. This is speculative and other views have been expressed, such as excess energy consumption through continuous scratching (18).

Why should pruritus and scratching become such a problem at night? The rise in skin temperature that occurs in a warm bed is a likely precipitant. In circadian terms, body temperature is highest in the late evening, falling to a low point around 6 am (19). Bedroom temperatures often reach a low between 4 and 6 am. We did not question parents about the time their children slept best, but several volunteered that wakings in the second half of the night were rare. This surprised us because our experience in ordinary sleep clinic practice is that most young children with night waking problems wake more, not less, in the second half of the night. It seems that eczematous children differ from other sleep-disturbed children, in sleeping better in the second half of the night when both body and environmental temperatures are lower.

When a young child shares a bed with a parent there is a strong possibility that its body temperature may be higher than when the child is on its own (20). Scratching, waking and general distress are the commonest reasons parents give for taking suffering children alongside them into bed. There they can at least give them some comfort and emotional support. So it is the children with the worst skins that are the most likely to encounter the warmest bed conditions. As stated earlier, we found that 30% of the children with AE, compared with 11% of non-AE children, regularly spent time in the parental bed. Co-sleeping, whilst quite normal in many cultures, is not trouble-free in Western contexts. In a study of Hispano-American families in New York all night co-sleeping was positively associated with sleep problems (21).

It has long been recognised that chronically sleep-deprived children often develop day-time behavioural deviations, characterised by irritability, poor concentration, hyperactivity, and poor school performance. Dahl et al. (13) found an association between sleep-related problems and difficulties in morning waking, day-time tiredness, irritability, aggressive behaviours and major discipline problems in their cohort of eczematous school age children. A Southampton study (unpublished) of handicapped and chronically ill children with sleep problems reported that 56% of the children had behaviour problems associated with early morning waking. A recent Manchester study (22) found that young children with atopic eczema had more behavioural problems than matched controls – 23% vs 5%. There is evidence that correction of night-time disturbances can lead to improved day-time functioning. Quine (2) found that the successful management of the sleep disorders of learning disabled children led to a concomitant improvement in day-time behaviour. A carefully conducted Canadian study of normal children with sleep problems obtained similar results (20).

Parents need to be informed that it is often possible to modify troublesome sleep patterns to the benefit of the family as a whole. Research described above suggests behaviour and school performance may also improve. Books and pamphlets

pertaining to children's sleep problems are widely available and could also be stocked in paediatric outpatient departments. Parents of children with sleep problems should be encouraged to seek help. Sleep clinics exist in many parts of the country and achieve good results with motivated parents. On present evidence co-sleeping should not be encouraged.

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